

ORGAN PIPES NATIONAL PARK — 10 YEARS ON

PHOTOS & TEXT: National Parks Service Victoria

LOOKING BACK

In 1974 Geoff Edwards, then a technical officer with the National Parks Service, wrote an article for *Victoria's Resources* entitled "Organ Pipes National Park — a study in applied conservation". Seven years later it seems fitting to continue the story of Organ Pipes National Park and to describe our progress, discussing achievements as well as failures. By doing that we hope we can share our experiences with readers and pass on insights into the complexities of rehabilitating disturbed lands.

THE BEGINNING OF A PARK

Organ Pipes National Park, a small pocket of land straddling Jacksons Creek, is only 20 km from the centre of Melbourne. The park entrance is along the Calder Highway between Keilor and Diggers Rest.

The most obvious feature of the Park is the basalt rock formation known as the Organ Pipes, a series of basalt columns rising almost vertically from the bed of Jacksons Creek to a height of 20 metres.

The first written record of these columns is a note on an undated survey map drawn around 1863. Further interest in the formation is not recorded until the early 1900s when parties from the Field Naturalists Club of Victoria had several excursions to the site. But the area was not readily accessible to the public as the land was privately owned and there was no Crown Land frontage to the creek, and so for many years knowledge of or interest in the Organ Pipes was limited to local people and to the few others who had heard or read about them.

Between 1950 and 1960 interest developed in the idea of obtaining land surrounding the Organ Pipes as a public reserve, so that the unusual and fascinating geology of the area could be appreciated by all who cared to visit. Later it was felt that such a reserve could serve another function — as a refuge for the diminishing basalt plains and river valley flora.

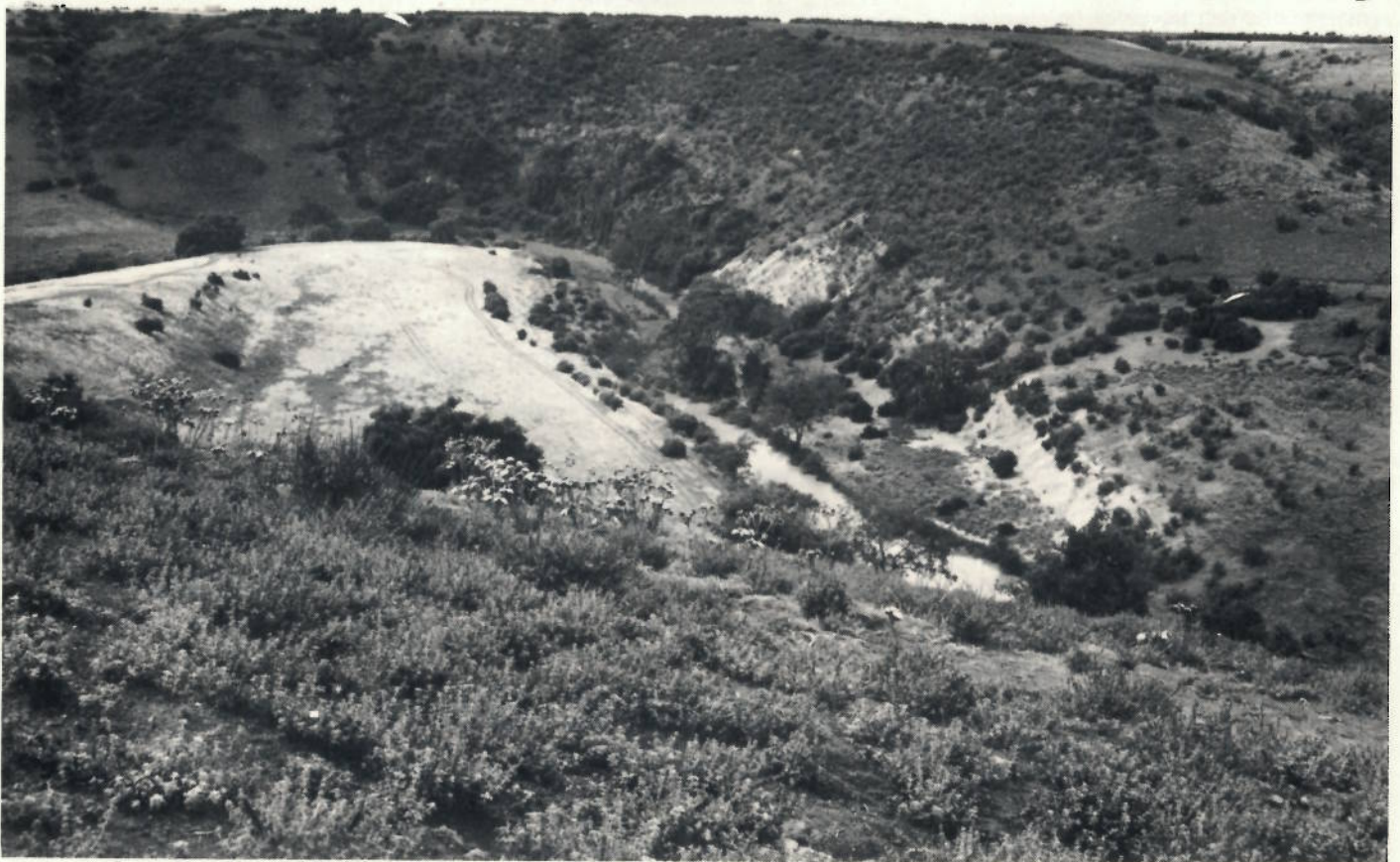
In 1970, 65 hectares of land including the Organ Pipes became the property of the State of Victoria through a gift from the estate of the last owner, Edward A. Green.

The property became a National Park in 1972 under the management of the National Parks Authority (later the National Parks Service).

THE PARK IN 1972

When the Organ Pipes National Park was declared in 1972 the land was in a state of serious neglect. The impact of European settlement had been devastating; the disregard of many years had resulted in almost total cover by noxious weeds. In terms of percentage cover the most significant of these plants were Artichoke Thistle (*Cynara cardunculus*), a perennial thistle of Mediterranean origin and probably an accidental introduction to Victoria; Boxthorn (*Lycium ferocissimum*), a perennial shrub from South Africa and probably introduced to Victoria as a hedge plant; and Horehound (*Marrubium vulgare*) a perennial plant from Southern Europe introduced accidentally or as a medicinal plant.

Despite this disturbing picture, the park was born with a spirit of optimism and hope. An interim policy for revegetation was



Organ Pipes National Park in 1972. Horehound, Artichoke Thistle and Boxthorn predominate with only a few native remnants.



The same area in 1981. Native species are thriving along the creek and on the flat and are taking a hold on the spur to the right. Slopes in the background are still infested with Artichoke and Boxthorn.

written detailing principles as well as guidelines so that the revegetation process could begin. The most significant of the policy statements, which are still in force today, are summarised below.

1. The goal of restoration is to achieve a condition as similar as is possible to that at the time of first European Settlement.
2. Only species known or assumed to be present in the park can be used for revegetation purposes.
3. Where possible propagating material for revegetation purposes shall be obtained from within the park or from the closest alternative source.
4. Species must be planted in their appropriate locations within the park.
5. Exceptions or special arrangements can be made for extraordinary situations (e.g. the limited planting of seedlings from localised occurrences of Murray Pine (*Callitris collumellaris*) and Desert Cassia (*Cassia nemophila*) close to, but outside the Park).

Although the re-establishment of the indigenous flora was a major objective of park management, there were also other important functions to be served by the park. First, there was the goal of preserving the scenic value of the geological features for public appreciation, and secondly, there was the opportunity to provide for passive recreation and environmental education. This article, however, deals mainly with the revegetation and rehabilitation of the park.

THE REVEGETATION PROGRAM

A good deal of thought and planning was needed to develop a works program which satisfied the above revegetation principles. To begin with, the park was divided into six revegetation zones. Each of these zones referred to a discrete vegetation type, and the major components of each were described. (See Table 1).

The development of this scheme was the work of the Maribyrnong Valley Committee (a sub-group of the Victorian National Parks Association), later to become the Friends of the Organ Pipes or FOOPs. The scheme was based on literature relating to the original flora, on observations of remnant flora in the park and at comparable nearby sites, and on a knowledge of the ecology of the flora. Once a basis for revegetation was established, attention could be turned to the practical problems of site preparation and plant propagation.

HELP FROM OUR FRIENDS

An enormous contribution to the revegetation of Organ Pipes National Park has been made by voluntary labour.

It is in fact an outstanding example of public participation. Not only do we have our own "Friends" group, FOOPs, but we also have input from numerous community groups, schools and other organisations.

Their efforts have been directed towards planting shrubs and trees, although FOOPs, from 1972, have been involved in a wide range of additional activities from the planning of the ecological basis of revegetation to the careful placing of species at working bees.

(In 1978 the FOOPs were awarded the Robin Boyd Environmental Award bronze medal by the Royal Australian Institute of Architects for their outstanding contribution to the environment.)

Since the revegetation program began in 1972, about 22,000 plants have been planted in the park. About half of these have been propagated by FOOPs and the remainder by the Forests Commission nursery at Macedon. Propagating material has been collected by FOOPs and park staff. The involvement of FOOPs in propagating plants — particularly ground-cover flora — has led to the propagation of species not previously attempted, and the techniques developed apply not only to Organ Pipes National Park but also to commercial use and to other rehabilitation programs.

THE PLANTING RECIPE

The planning and carrying out of revegetation works is quite simple. An area of the park is usually selected 3 years in advance of any planting. Weed control is coordinated to ensure that the chosen area is relatively weed-free by the planned date of

planting. Two years before planting a rough list of plant requirements is made so that the propagating material can be collected before it is needed; and one year before planting, arrangements are made to propagate the plants needed for the planting year.

PROBLEMS, PROBLEMS, PROBLEMS

But this simple resume of operations does not tell the full story of the difficulties of weed control and plant establishment at the

Organ Pipes. The ferocity with which some of the weeds have invaded the valley of Jacksons Creek has made the task of rehabilitation a slow and difficult one.

The strategy to date has been to remove individual weeds by the most appropriate methods (both physical and chemical) and to allow the spread of grasses into cleared areas. This provides competition against weed re-invasion, and also stabilises soils.

In several areas, native grass seed (Wallaby and Spear grasses) has been spread to encourage the return of these species rather than introduced grasses. However,

the supply of seed material has been limited by a lack of suitable collection sites, and while it would be ideal to replace the exotic ground cover by indigenous grasses, in practical terms it is difficult. This limitation becomes a real problem where the invading or colonising grasses are weeds in their own right.

A good example is *Phalaris (Phalaris tuberosa)*; its spread and habit make it a serious intruder in areas ear-marked for revegetation.

Where tree density is sufficiently high, tree canopies effectively control these problems by shading the understorey. But in many areas there is much open space between shrubs and trees.

Another problem is the harshness of the environment for seedling establishment. Planting is restricted to times of the year when enough moisture is present to enable establishment. It begins after a sustained Autumn break, and continues until Spring.

Areas likely to encounter most moisture stress are planted first. Watering in of plants is restricted to late plantings that are likely to miss substantial rains.

Each plant is protected by a wire-netting guard enclosed by a hessian cover to give protection from the strong winds that characterise the Keilor Plains. A scoria-based mulch is then spread around each plant to conserve moisture and retard weed growth.

Although the wire guards protect seedlings from rabbit grazing, the problem of rabbits grazing on natural regeneration can only be countered by reducing rabbit numbers.

To achieve this in a small park, an important step is to fence the park to prevent re-infestation by rabbits from outside.

Within the park a combination of control methods can be used to reduce rabbit numbers. Initial reduction in populations can be made by controlled baiting and the introduction of myxomatosis with suitable vectors. Permanent reductions become possible when unfavourable changes to rabbit habitat are made. These changes involve removal of harbour (especially boxthorn) and destruction of warrens.

At Organ Pipes these operations have been restricted by limited resources; however, a comprehensive program has begun, and permanent reductions should soon be observed.

Another problem at Organ Pipes is a weed colonisation problem similar to that of rabbit re-infestation. Adjacent properties have severe noxious weed infestations and they are a source of seed that can be blown or carried into the park. Of these weeds, Serrated Tussock (*Nassella trichotoma*) is possibly the greatest threat in that its seed can be blown considerable distances and readily colonises disturbed soil (such as often follows other weed control operations). The problem is almost insurmountable unless co-operation of neighbouring land-owners can be gained.

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STRATEGIES FOR REHABILITATION

The revegetation program at Organ Pipes has provided valuable lessons in the art of rehabilitating disturbed land. Solutions have yet to be found to many problems but steady progress is being made.

Probably the most important lesson is that the problem weeds are problems because they are so well suited to the environment of the park. It is pointless to reduce their populations unless the physical or biological environment is changed so that it disfavours the weed; otherwise it is almost certain that the weed will recolonise the areas it previously occupied. The aim of rehabilitation here is to permanently reduce or eradicate the problem weeds and to replace them with a stable, regenerating flora of indigenous species.

Two main changes have been made to the environment at Organ Pipes to disfavour weeds.

The first is the reduction in grazing pressure (by removal of stock, and vermin control) which when combined with the removal of weeds allows grasses to recolonise and cover slopes. This grass cover can then act as a barrier to re-invasion by the major weeds.

The second change is the general re-introduction of indigenous plant material (seed and seedlings) which can compete directly with weed species. The general thrust is towards providing direct competition with weeds, reducing their regeneration and recolonisation rates, and favouring the

TABLE 1 — REVEGETATION ZONES (1973 Scheme *)

ZONE	DESCRIPTION and MAJOR SPECIES
REDGUM	<ul style="list-style-type: none"> — Riparian community extending from creek to outer boundary of alluvial flats. — River Red Gum (<i>Eucalyptus camaldulensis</i>), Silver Wattle (<i>Acacia dealbata</i>), Blackwood (<i>A. melanoxylon</i>), Prickly Moses (<i>A. verticillata</i>), River Bottlebrush (<i>Callistemon palludosus</i>), Woolly Tea-tree (<i>Leptospermum lanigerum</i>).
YELLOW BOX	<ul style="list-style-type: none"> — Defined by shallow soils on sandstones or sands found at low levels along the sides of the creek valley. — Yellow Box (<i>Eucalyptus melliodora</i>), Yellow Gum (<i>E. leucoxylon</i>), Black Wattle (<i>Acacia mearnsii</i>), Golden Wattle (<i>A. pycnantha</i>), Desert Cassia (<i>Cassia nemophila</i>), Turkey Bush (<i>Myoporum desertii</i>).
LIGHTWOOD	<ul style="list-style-type: none"> — Steep, rocky, basalt slopes of creek valley. — Lightwood (<i>Acacia implexa</i>), Tree Violet (<i>Hymenanthera dentata</i>), Wedge-leaf Hop-Bush (<i>Dodonaea cuneata</i>).
SHE-OAK	<ul style="list-style-type: none"> — Gentle basalt slopes where plains meet the creek escarpment. — Drooping She-oak (<i>Casuarina stricta</i>), Tree Violet (<i>Hymenanthera dentata</i>), Hedge Wattle (<i>Acacia armata</i>), grasses and composites.
GREY BOX	<ul style="list-style-type: none"> — Basal soils where moisture stress is less than that experienced on the basalt plains. — Grey box (<i>Eucalyptus microcarpa</i>), Sweet Bursaria (<i>Bursaria spinosa</i>), Drooping She-oak (<i>Casuarina stricta</i>), grasses, composites and salt-bushes.
GRASSLAND	<ul style="list-style-type: none"> — Keilor Basalt Plains. — Scattered trees and shrubs, predominantly grassland.

* This scheme was reviewed in 1981. A more detailed zoning plan was developed including density-species lists for each zone.



A "Friends of the Organ Pipes" working bee. Volunteers prepare to plant a tree seedling on a steep slope above Jacksons Creek.



Sunday visitors enjoy the spectacular display of Silver Wattle along the track near the creek. A wire frame is placed around the seedling and secured with steel pegs hammered into the ground. Hessian is then tied around the frame.



TREES AND VICTORIA'S RESOURCES

re-establishment and regeneration of the native flora.

ORGAN PIPES NATIONAL PARK IN 1981

Well over a third of the park has been replanted with indigenous plants. Over a hundred different species have been planted, although the majority of the plantings have been of about 25 different species of trees and shrubs.

The revegetation zones have recently been revised, and improved working plans for operations have been developed. Many other developments, such as new visitor facilities, improved tracks, special plantings of rare species and research into weed control have also taken place. And the park has increased in size from its original 65 hectares to 96 hectares.

Already the park provides a welcome retreat for picnickers, bird watchers and field naturalists. The annual number of visitors has increased from about 30,000 in 1973/4 to 85,600 in 1979/80. Many schools make good use of the park for excursions; over 300 school visits are made each year, with up to 150 students per visit. An information brochure and teacher's guide explain features of the park to visitors. Organ Pipes National Park has become an important public reserve providing for conservation, education and recreation for the community at large.

Restoration and rehabilitation is a continuing project, and new volunteers are always welcome at working bees. We also invite readers who are involved or interested in similar projects to visit the park and talk to the rangers, or to contact the National Parks Service.

MICROPROPAGATION OF FOREST TREES

The CSIRO Division of Forest Research has developed a tissue culture technique for micropropagation of a variety of eucalypt species. A considerable demand now exists for clones produced using the techniques for evaluation in experimental plantations.

CSIRO wishes to collaborate with a commercial organisation in producing and marketing experimental quantities of plants, reviewing the techniques and expanding their applicability to further species and genera. Expressions of interest are now sought from organisations involved in commercial propagation who wish to enter into formal collaboration with CSIRO in the area of micropropagation. Further information may be obtained from:

The Officer-in-Charge
Commercial Group
PO Box 277
CIVIC SQUARE ACT 2608
Telephone (062) 48 4531